



School of  
Public Policy



BRIEFING PAPER  
Volume 17:10  
August 2024

**THE  
SIMPSON  
CENTRE.**



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# Enhancing Canada's Beef Exports and Competitiveness in the Global Market

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# Enhancing Canada's Beef Exports and Competitiveness in the Global Market

Pascal L. Ghazalian

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## EXECUTIVE SUMMARY

Alberta reports the highest revenues among all provinces in beef cattle ranching and farming, but there is still considerable potential to maximize profits by expanding international trade. In 2022, Canada exported 0.78 million head of cattle and 430,000 metric tonnes of beef, for a total trade value of C\$5.2 billion. That same year, Canada ranked eighth globally in the volume of beef exports, sixth in the value of beef exports and fourth in the aggregate value of live cattle and beef exports.

This study aims to provide a policy brief on Canada's beef and cattle production and exports, and international market access and conditions. Trade barriers are identified and evaluated, and the implications of non-tariff measures (NTMs) are examined. These include, for example, the ban imposed by the European Union and the United Kingdom on the importation of peroxyacetic acid (PAA)-treated and hormone-treated beef, and the United States' political/legislative attempts to invoke the mandatory country-of-origin labelling (CoOL) standard for Canada's beef exports. This study also discusses the benefits and limitations of preferential trade agreements (PTAs) for Canada's beef exports, such as the Canada-U.S.-Mexico Agreement (CUSMA); the Canada-EU Comprehensive Economic and Trade Agreement (CETA); and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). The study concludes by exploring the opportunities to increase Canada's beef exports and competitiveness in international markets.

The analysis indicates that the Canadian cattle/beef sector would benefit from pursuing general strategies to increase its competitiveness in foreign markets by promoting its beef, raising production efficiency and reducing production costs, tackling labour shortages, alleviating regulatory constraints and integrating novel technologies in beef production and processing. The Canadian cattle/beef sector must increase its competitiveness in international markets and diversify export destinations while maintaining access to the U.S. market. Canada is a major player globally, but it needs to increase its competitiveness in, for example, China, Japan, South Korea, Saudi Arabia, Vietnam, Taiwan and the United Arab Emirates as these markets currently rely heavily on beef imports from Australia, Brazil and the U.S., among other countries.

It would be critical to encompass strategies tailored to the market characteristics/conditions of destination countries, raise the effectiveness of PTAs and stimulate bilateral business/marketing networks. This study emphasizes the importance of sustaining market access to the U.S., enhancing market access to other foreign countries and pursuing pronounced diversification strategies in beef exports to mitigate risks and uncertainties in international markets. It also underlines the basic requirement of raising competitiveness vis-à-vis other beef-exporting countries in various international markets. In this context, trade preferences may not necessarily lead to significant increases in Canada's beef exports to foreign markets when preferential access is more pronounced for beef exported from other countries. Also, cost reductions should be relatively significant to effectively compete with other beef-exporting countries and realize increases in Canada's beef exports to international markets.

## KEY POLICY RECOMMENDATIONS

- The Canadian cattle/beef sector would benefit from pursuing general strategies to increase competitiveness in foreign markets by promoting its beef, raising production efficiency, tackling labour shortages, alleviating regulatory constraints and integrating novel technologies.
- Given the distinct trade conditions facing Canada's cattle/beef exports to each country, it is essential to develop complementary strategies specific to destination markets and to raise the effectiveness of preferential trade agreements (PTAs) by eliminating or lessening non-tariff measures (NTMs) and stimulating bilateral business/marketing networks.
- This study emphasizes the importance of sustaining market access to the United States, enhancing market access to other foreign countries and pursuing pronounced diversification strategies in beef exports to mitigate risks and uncertainties in international markets.
- It is important to establish effective communication with authorities in destination countries via diplomatic/political and economic channels to elucidate the current and impending consequences for the cattle/beef trade and promote their elimination.
- This study underscores the significance of raising Canada's beef competitiveness vis-à-vis other beef-exporting countries in international markets. In this context, trade preferences may not necessarily lead to significant increases in Canada's beef exports to foreign markets when preferential access is more pronounced for beef exported from other countries.

## INTRODUCTION

The cattle/beef sector has significant importance in Canadian agriculture and the country's overall economy. According to the Census of Agriculture 2021, the total number of cattle stood at 12.6 million head units.<sup>1</sup> Approximately 54,500 farms reported having beef cattle, with a total number of about 3.8 million head units. In 2021, Canada produced about 1.39 million metric tonnes (MT) of beef.<sup>2</sup> Besides these significant production statistics, Canada is a major player in the international cattle/beef market. According to the 2022 statistics, Canada ranks eighth globally in the volume of beef exports, sixth in the value of beef exports and fourth in the aggregate value of live cattle and beef exports. In 2022, Canada's live cattle and beef exports amounted to 0.78 million head units and 430,000 MT respectively, for a total value of C\$5.2 billion current.<sup>3</sup> Table 1 presents sorted statistics of major live cattle/beef-exporting countries in 2022, showing Canada's global ranking.

**Table 1. Descriptive Statistics of Major Beef and Live-Cattle Exporting Countries in 2022**

Rank	Total Beef Exports —	Volumes (1,000 MT)	Total Beef Exports	Values (Million Current C\$)	Total Live Cattle and Beef Exports	Values (Million Current C\$)
1	Brazil	1991.3	Brazil	15,366.6	Brazil	15,616.8
2	U.S.	1145.1	U.S.	13,248.0	U.S.	13,838.9
3	India	1060.1	Australia	9,306.9	Australia	10,445.0
4	Australia	930.8	Netherlands	4,502.3	Canada	5,576.4
5	Argentina	629.0	Argentina	4,471.2	Netherlands	4,844.9
6	New Zealand	478.9	Canada	4,067.2	Argentina	4,471.4
7	Netherlands	447.0	New Zealand	3,986.2	New Zealand	4,294.8
8	Canada	430.1	India	3,839.0	France	3,932.5
9	Ireland	389.3	Ireland	3,600.0	India	3,839.0
10	Uruguay	381.4	Uruguay	3,323.1	Ireland	3,819.1

Exporting cattle and beef entails trade costs, which generally encompass all costs associated with delivering a product to the final consumers, above the marginal costs of production (Anderson and van Wincoop 2004). Trade costs emanate from policy and non-policy trade barriers. Policy trade barriers are generated from trade policies that include, among others, tariffs, tariff rate quotas (TRQs) and non-tariff measures (NTMs). The latter can be sub-categorized into technical measures such as standard requirements, sanitary and phytosanitary measures, regulations and certifications, and non-technical measures including quotas, logistics and distribution policies and price measures.<sup>4</sup> Non-policy trade barriers cover the implications of the geographic distance, and they result in transportation costs such as freight charges, insurance and handling, information and communication costs and time costs, among others. Transaction costs are generally significant in international trade, being considerably higher compared to domestic transaction

<sup>1</sup> This number includes 4.05 million calves (under one year), 1.63 million steers, 1.98 million heifers (of which 0.88 million heifers for slaughter or feeding, 0.67 million heifers for beef herd replacement and 0.43 million heifers for dairy herd replacement), 3.8 million beef cattle, 0.98 million dairy cows and 0.22 million bulls.

<sup>2</sup> Beef production statistics are obtained from the Food and Agriculture Organization (FAO) Statistics (FAOSTAT) database, <https://www.fao.org/faostat/en/#data>. In this database, beef corresponds to the meat of cattle with the bone, fresh or chilled.

<sup>3</sup> Live cattle and beef export statistics are obtained from the UN Comtrade database, <https://comtradeplus.un.org/>. See the next section for more details on live cattle and beef export statistics.

<sup>4</sup> Many studies (e.g., Beghin et al. 2012; Beghin and Xiong 2021) analyzed the trade and welfare effects of NTMs.

costs (Head 2007). They include various costs incurred during: 1) the contact (search/multilateral learning) phase; 2) the contract phase, which covers engagement, negotiations and contract formation between the seller and the buyer; and 3) the control (monitoring and enforcement) phase (den Butter and Mosch 2003; Head 2007).

Preferential trade agreements (PTAs) often lead to decreased trade costs by reducing policy trade barriers and enhancing business networks among member countries.<sup>5</sup> In effect, the empirical literature, such as Sarker and Jayasinghe (2007); Lambert and McKoy (2009); Sun and Reed (2010); Ghazalian (2017); and Timsina and Culas (2020) showed that many PTAs have had positive impacts on agricultural trade flows among member countries. Ghazalian (2017) found the North American Free Trade Agreement (NAFTA) positively affected trade flows of agricultural products between Canada and its NAFTA trading partners, the U.S. and Mexico. Also, non-policy trade costs have been decreasing, driven by upgrades in transportation logistics and improvements in information and communication technology, among other factors. Nevertheless, important barriers continue to hinder international trade in agricultural products. For instance, the pervasiveness of NTMs and the significance of transaction costs have constrained agricultural trade flows and limited market access.

Alberta reports the highest revenues among all provinces in beef cattle ranching and farming, but there is still considerable potential to maximize profits by expanding international trade. This study aims to provide a policy brief on Canada's beef and cattle production and exports, and on international market access and conditions. It also examines the trade barriers hindering Canada's beef exports and assesses the opportunities and limitations that various PTAs present. This paper concludes by proposing policies that would bolster Canada's beef exports to conventional and new markets and enhance its beef industry's competitiveness globally.

Canada's beef exports have been generally increasing. PTAs, decreases in policy and non-policy trade barriers and increases in international market demand have driven these trends. The largest share of Canada's beef exports goes to its natural trading partner, the U.S. Most of Canada's live cattle exports also go to the U.S. Canada exports significant amounts of beef to other international markets, such as Japan, Mexico and South Korea. Despite the considerable growth, wide margins remain to raise beef exports to conventional trading partners and promote access to new markets. Ghazalian (2019) empirically showed that Canada's beef exports still face significant trade impediments (as expressed through the "border effects"),<sup>6</sup> and that there are broad prospects to further increase beef exports to international markets.

Some specific technical measures have inflicted temporary or prolonged restrictions/bans on the importation of Canadian beef. Some prominent examples of technical measures facing Canada's beef exports are the European Union (EU) ban on the importation of beef/carcass washed with peroxyacetic acid (PAA) and China's ban on the importation of Canadian beef following the detection of an atypical bovine spongiform encephalopathy (BSE) case in Alberta in late 2021. Also, the U.S.'s recent political/legislative attempts to bring back the mandatory country-of-origin labelling (CoOL) standard for beef products threaten to adversely affect Canada's exports to its largest trading partner. Policy-makers and beef industry stakeholders face the economic challenges and repercussions following the COVID-19 pandemic, such as a higher inflation rate<sup>7</sup> and the implications of global and regional political instability (Russia's invasion of Ukraine; conflicts in the Middle East) through proper exporting and market access strategies.<sup>8</sup>

<sup>5</sup> PTAs encompass regional and inter-regional trade agreements, and bilateral and unilateral trade agreements.

<sup>6</sup> In the empirical literature, the term "border effects" pertains to the estimation of the effects of international borders on international trade flows (McCallum 1995; Anderson and van Wincoop 2003).

<sup>7</sup> The outbreak of the COVID-19 pandemic has inflicted distortions on Canada's live cattle and beef trade, but there have been subsequent recoveries following the initial shocks (Rude 2020, 2021; Weersink et al. 2021).

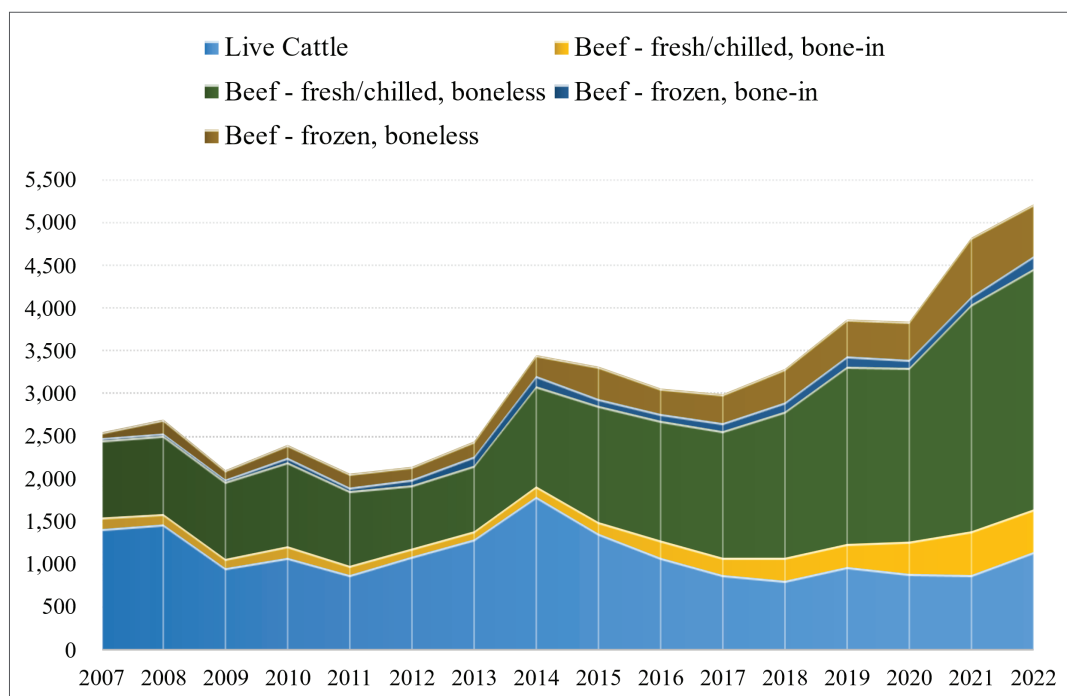
<sup>8</sup> It is worth noting the implications of exchange rates for Canada's live cattle and beef exports. For instance, an

## CANADA'S LIVE CATTLE AND BEEF EXPORTS: AN OVERVIEW

The aggregate value of Canada's live cattle and beef exports has generally trended upward, albeit with fluctuations and decreases in some years. These increases are primarily driven by episodes of significant growth in beef exports. In contrast, live cattle exports have experienced some decreases, notably after 2014. To illustrate these trends, Figure 1 presents the total values of Canada's live cattle and beef exports from 2007 to 2022 in current Canadian dollars, whereas Figure 2 shows the values in constant Canadian dollars to account for inflation, using 2015 as the base year.<sup>9</sup> These figures cover the total values of Canada's live cattle and beef exports, and the export values of the following four beef product categories<sup>10</sup>:

- Fresh/chilled bone-in beef (including carcasses and half-carcasses), which corresponds to the Standard International Trade Classification (SITC) category 1111 (meat of bovine animals, fresh/chilled, with bone-in);
- Fresh/chilled boneless beef, which is equivalent to the SITC category 1112 (meat of bovine animals, fresh/chilled, boneless);
- Frozen bone-in beef (including carcasses and half-carcasses), which corresponds to the SITC category 1121 (meat of bovine animals, frozen, with bone-in); and
- Frozen boneless beef, equivalent to the SITC category 1122 (meat of bovine animals, frozen, boneless).

**Figure 1. Canada's Total Live Cattle and Beef Exports — Values (Million Current C\$)**

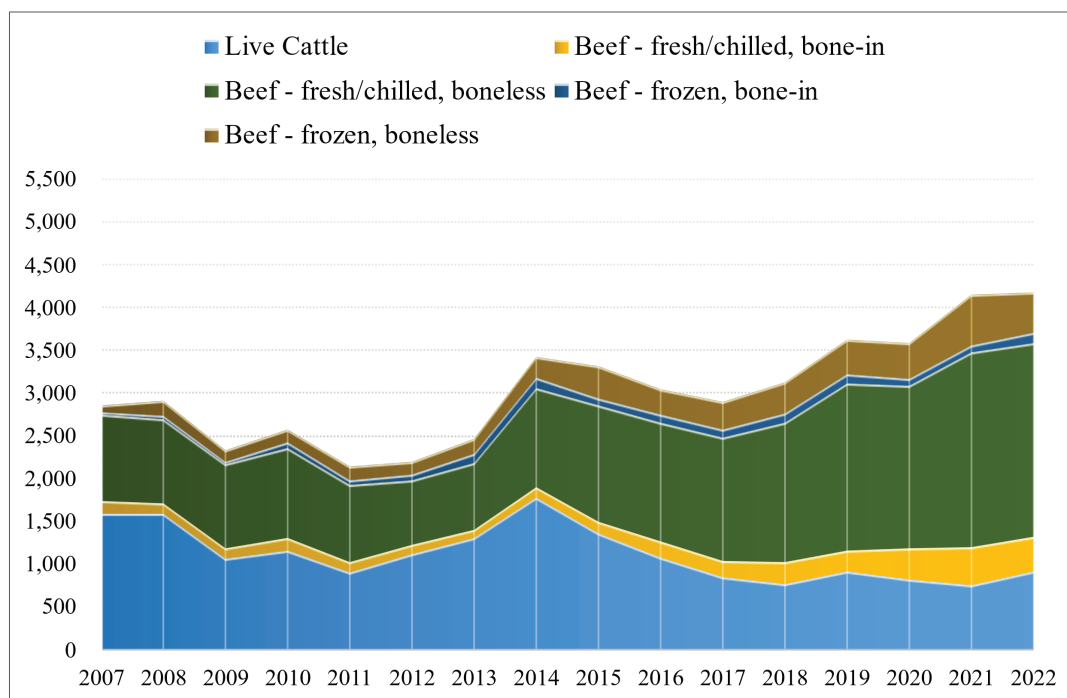


appreciation of the Canadian dollar vis-à-vis the U.S. dollar would make Canada's exports of beef and live cattle more expensive for U.S. buyers, whereas a depreciation of the Canadian dollar will render Canada's exports of live cattle and beef less expensive for U.S. buyers. Also, changes in exchange rates would affect costs of production since currency appreciation will make imported inputs less expensive (and vice versa).

<sup>9</sup> Henceforth, all constant values are reported using 2015 as the base year.

<sup>10</sup> Data are sourced from the UN Comtrade database, <https://comtradeplus.un.org/>) for beef, live cattle and beef offal.

**Figure 2. Canada's Total Live Cattle and Beef Exports — Values (Million Constant C\$)**



Note: Values in constant C\$ are determined using 2015 as the base year.

The total value of beef exports is determined by aggregating over the aforementioned SITC beef product categories. Figure 2 demonstrates generally increasing beef export trends with some moderate decreases and fluctuations in specific years. For instance, Figure 2 reveals some moderate drops between 2010 and 2013 — a period characterized by an appreciation of the Canadian currency vis-à-vis the U.S. dollar and other currencies. Also, the 2020 outbreak of the COVID-19 pandemic altered the growth in beef exports that occurred over the preceding years. Figure 2 also highlights decreases in live cattle exports after 2014. Yet, the aggregate value of live cattle and beef exports has been following an upward trend, suggesting substitution from live cattle to beef exports.

In 2022, the total value of Canada's beef exports (as defined by the aggregation of the four categories above) amounted to C\$4.07 billion current (or C\$3.26 billion constant). In comparison, beef exports in 2013 and 2019 stood at lower values of C\$1.14 and C\$2.90 billion current (or C\$1.15 and C\$2.72 billion constant). Canada's fresh/chilled boneless beef exports constitute the largest share of its beef exports, standing at 69.37 per cent in 2022 (with corresponding values of C\$2.82 billion current or C\$2.26 billion constant). It is worth noting that the shares of fresh/chilled boneless beef exports were moderately higher in earlier years; for example, 74.28 per cent in 2010 (with corresponding values of C\$0.97 billion current and C\$1.05 billion constant). Exports of fresh/chilled and frozen bone-in beef represent 12.30 per cent and 3.56 per cent of Canada's total beef exports in 2022 (standing at values of C\$0.40 and C\$0.12 billion constant) respectively. Also, Canada's exports of frozen boneless beef are significant at 14.77 per cent of Canada's total beef exports in 2022 (with a corresponding value of C\$0.48 billion constant).

The pandemic's implications are noticeably expressed through smaller increases in export values in 2020 compared to more significant increases in the preceding years. For instance, the total value of beef exports in 2020 stood at C\$2.95 billion current (or C\$2.75 billion constant), slightly



higher than the corresponding values in 2019 (C\$2.90 billion current or C\$2.72 billion constant). However, Canada's beef exports bounced back in 2021 with a significant rise, reaching C\$3.95 billion current (or C\$3.40 billion constant). This is followed by a relative deceleration in 2022 with post-COVID-19 economic challenges, such as high inflation rates and global political uncertainties created by Russia's invasion of Ukraine.

Figure 3 illustrates the volume of beef exports in each category for selected years. In 2022, Canada exported 301,000 and 78,700 MT of fresh/chilled and frozen boneless beef respectively, compared to 171,600 and 36,200 MT one decade ago. Also in 2022, Canada exported 35,000 and 15,400 MT of fresh/chilled and frozen bone-in beef, compared to 12,100 and 5,500 MT respectively in 2013. Figure 3 also illustrates the implications of the COVID-19 pandemic for Canada's beef exports. For instance, the total volume of fresh/chilled boneless beef exports moderately decreased to 267,400 MT in 2020, down from 285,100 MT in 2019.

**Figure 3. Canada's Total Beef Exports – Volumes (1,000 MT)**

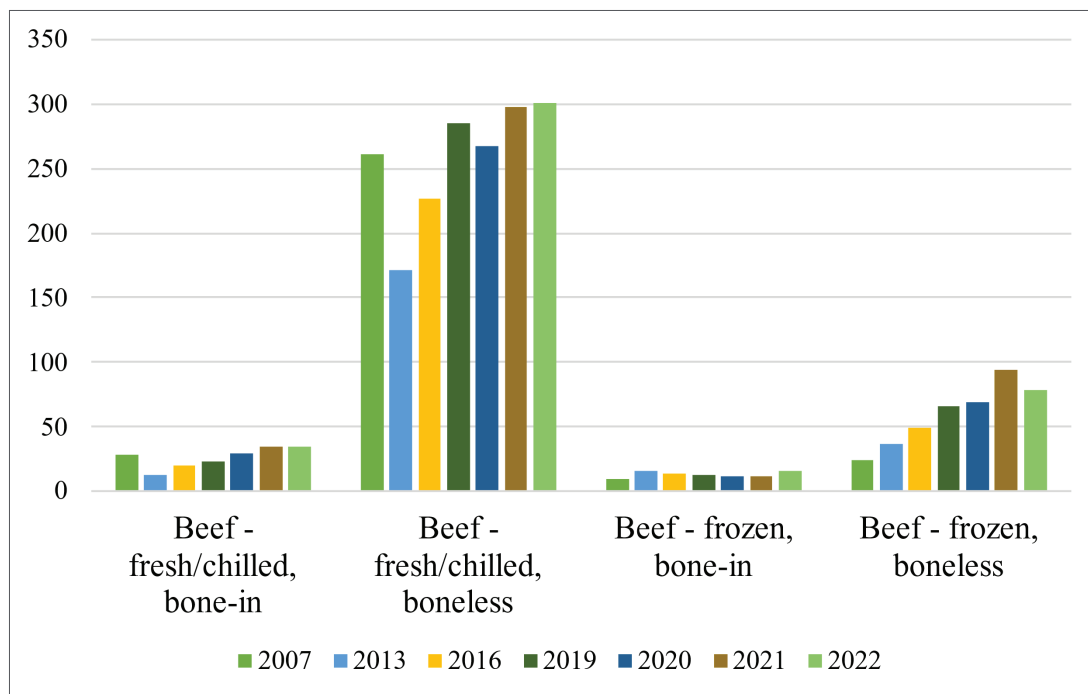


Figure 4 displays the number in head units of live cattle exported to the U.S. In 2022, Canada exported 0.78 million head with a corresponding value of C\$1.15 billion current (or C\$0.92 billion constant). Comparatively, Canada's exports of live cattle stood at 1.42 million head units in 2007 for a value of C\$1.42 billion current (or C\$1.59 billion constant). These significant decreases over the last 15 years underline the vertical relationship between live cattle and beef (Ghazalian et al. 2012) with gradual shifts toward the beef trade. These changes partly stem from the meat-packing industry's expansion in Alberta and the increased size of the U.S. cattle herd. Most of Canada's live cattle exports are destined for the U.S., driven by the highly integrated supply chain and business networks, proximity and trade preferences.

**Figure 4. Canada's Total Live Cattle Exports — Volumes (Head Units)**

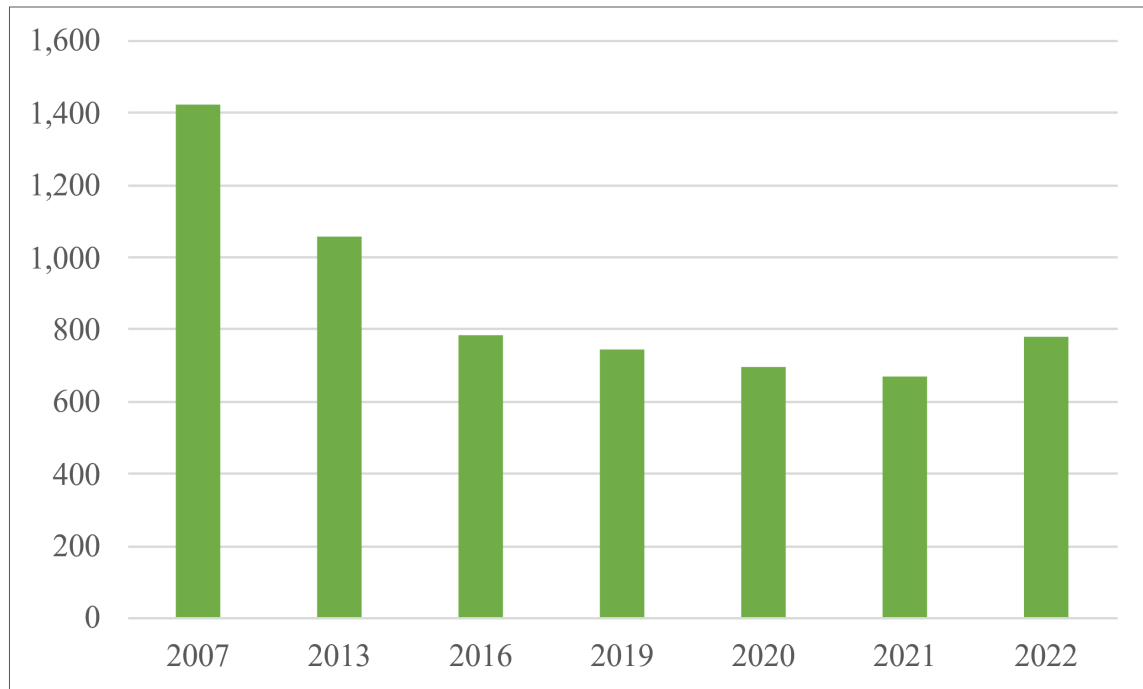


Table 2 presents a summary of Canada's total exports of live cattle and beef for selected years. In 2022, the total value of live cattle and beef exports amounted to C\$5.21 billion current, equivalent to C\$4.18 billion constant. The total value of live cattle and beef exports moderately decreased from C\$3.62 billion constant in 2019 to C\$3.58 billion constant in 2020 due to the COVID-19 outbreak, but it bounced back to C\$4.15 billion constant in 2021. Overall, the total value of live cattle and beef exports has significantly increased. For instance, the total value of live cattle and beef exports stood at C\$2.47 billion constant in 2013, compared to C\$4.18 billion constant in 2022. This is equivalent to an export growth of 69.7 per cent. PTAs, the sustained repeal of the U.S.'s mandatory CoOL regulation and the Canadian cattle/beef sector's efforts to access new markets and increase exports to conventional markets have all contributed to realizing this considerable growth. However, significant opportunities remain for the sector to further increase exports and enhance its competitiveness vis-à-vis other exporting countries, such as Australia, Brazil and the U.S. in various international markets, including China, Japan, South Korea, Saudi Arabia and the United Arab Emirates (UAE). The sector would benefit from setting long-term strategies to diversify export destinations while sustaining access to the U.S. market. Also, this sector must monitor international political and economic conditions in destination markets and have contingent plans to mitigate the implications of any restriction/ban on Canadian beef/cattle imports.

**Table 2. Canada's Live Cattle and Beef Exports**

	2007	2013	2016	2019	2020	2021	2022
	<b>Value (Million Current C\$)</b>						
Live Cattle	1,421.1	1,299.1	1,084.2	973.9	889.4	874.6	1,145.5
Beef - fresh/chilled, bone-in	126.3	87.8	196	264.5	377.9	513.4	500.3
Beef - fresh/chilled, boneless	899.9	774.6	1,396.7	2,083.7	2,040.1	2,653.5	2,821.4
Beef - frozen, bone-in	30.3	104.9	93.5	114.9	85.2	92.5	144.6
Beef - frozen, boneless	70.6	174.6	293.1	433.4	451.7	686.9	600.9
Beef (Total)	1,127.1	1,141.9	1,979.3	2,896.5	2,954.9	3,946.3	4,067.2
Beef and Live Cattle (Total)	2,548.2	2,441.0	3,063.5	3,870.4	3,844.3	4,820.9	5,212.7
	<b>Value (Million Constant C\$)</b>						
Live Cattle	1,594.9	1,312.7	1,076.1	913.1	828.8	753.6	919.6
Beef - fresh/chilled, bone-in	141.7	88.7	194.6	248.0	352.2	442.4	401.6
Beef - fresh/chilled, boneless	1,010.0	782.7	1,386.3	1,953.7	1,901.2	2,286.3	2,264.9
Beef - frozen, bone-in	34.0	106.0	92.8	107.8	79.4	79.7	116.1
Beef - frozen, boneless	79.3	176.4	290.9	406.4	420.9	591.9	482.3
Beef (Total)	1,265.0	1,153.8	1,964.6	2,715.9	2,753.7	3,400.3	3,264.9
Beef and Live Cattle (Total)	2,859.9	2,466.5	3,040.7	3,629.0	3,582.5	4,153.9	4,184.5
	<b>Quantity (Live Cattle, 1,000-Head Units; Beef, 1,000 MT)</b>						
Live Cattle	1,424.3	1,055.8	784.9	742.9	697.2	669.9	779.1
Beef - fresh/chilled, bone-in	28.7	12.1	20.0	23.0	29.2	34.7	35.0
Beef - fresh/chilled, boneless	261.4	171.5	227.0	285.1	267.4	298.2	301.0
Beef - frozen, bone-in	9.6	15.5	13.3	12.5	11.3	11.8	15.4
Beef - frozen, boneless	24.1	36.2	48.9	65.7	68.9	93.6	78.7
Beef (Total)	323.8	235.3	309.2	386.3	376.8	438.3	430.1

## DESTINATIONS OF CANADA'S LIVE CATTLE AND BEEF EXPORTS

**United States:** The U.S. is the major international market for Canada's live cattle and beef exports. Table 3 presents the values of Canada's live cattle and beef exports to the U.S. (in current and constant Canadian dollars) and the corresponding export volumes (in head units for live cattle and 1,000 MT for beef).<sup>11</sup> This table shows that Canada's live cattle and beef exports to the U.S. reached around C\$1.15 and C\$3.18 billion current (or C\$0.92 and C\$2.55 billion constant) respectively in 2022, amounting to a total of C\$4.32 billion current (or C\$3.47 billion constant). In terms of volumes, Canada's exports reached 0.78 million live cattle heads and 331,200 MT of beef in 2022. According to these statistics, the U.S. market still accounts for most of Canada's live cattle exports and 78.1 per cent of Canada's total beef exports in value terms (or 77.0 per cent of Canada's total beef exports in volume terms). Overall, Canada's live cattle and beef exports to the U.S. stood at 82.9 per cent of Canada's total export values in 2022.

<sup>11</sup> Also, see Figures A.1, A.2, A.3 and A.4 in the Appendix for graphical illustrations of Canada's live cattle and beef exports to the U.S. over time.

**Table 3. Canada's Live Cattle and Beef Exports to the U.S.**

	2007	2013	2016	2019	2020	2021	2022
	<b>Value (Million Current C\$)</b>						
Live Cattle	1,421.1	1,297.9	1,083.9	973.4	889.4	874.6	1,145.5
% of Canada's Total Exports	(≈100%)	(≈100%)	(≈100%)	(≈100%)	(≈100%)	(≈100%)	(≈100%)
Beef - fresh/chilled, bone-in	119.1	80.7	179.9	244.9	357.1	488.0	471.0
Beef - fresh/chilled, boneless	756.5	683.0	1,284.0	1,811.8	1,814.9	2,353.6	2,518.9
Beef - frozen, bone-in	6.2	16.6	14.2	10.9	9.0	13.3	13.1
Beef - frozen, boneless	27.6	37.6	41.5	58.8	64.3	130.3	174.2
Beef (Total)	909.4	817.9	1,519.6	2,126.4	2,245.3	2,985.3	3,177.2
<b>% of Total Beef Exports</b>	<b>(80.7%)</b>	<b>(71.6%)</b>	<b>(76.8%)</b>	<b>(73.4%)</b>	<b>(76.0%)</b>	<b>(75.6%)</b>	<b>(78.1%)</b>
Live Cattle and Beef (Total)	2,330.5	2,115.8	2,603.5	3,099.8	3,134.7	3,859.8	4,322.7
<b>% of Total Cattle &amp; Beef Exports</b>	<b>(91.5%)</b>	<b>(86.7%)</b>	<b>(85.0%)</b>	<b>(80.1%)</b>	<b>(81.5%)</b>	<b>(80.1%)</b>	<b>(82.9%)</b>
	<b>Value (Million Constant C\$)</b>						
Live Cattle	1,594.8	1,311.6	1,075.7	912.7	828.8	753.5	919.6
% of Canada's Total Exports	(≈100%)	(≈100%)	(≈100%)	(≈100%)	(≈100%)	(≈100%)	(≈100%)
Beef - fresh/chilled, bone-in	133.6	81.5	178.5	229.6	332.8	420.5	378.1
Beef - fresh/chilled, boneless	849.0	690.2	1,274.4	1,698.7	1,691.2	2,027.9	2,022.0
Beef - frozen, bone-in	6.9	16.8	14.1	10.2	8.4	11.5	10.5
Beef - frozen, boneless	31.0	38.0	41.2	55.1	59.9	112.3	139.9
Beef (Total)	1,020.5	826.5	1,508.2	1,993.6	2,092.3	2,572.2	2,550.5
<b>% of Total Beef Exports</b>	<b>(80.7%)</b>	<b>(71.6%)</b>	<b>(76.8%)</b>	<b>(73.4%)</b>	<b>(76.0%)</b>	<b>(75.6%)</b>	<b>(78.1%)</b>
Live Cattle and Beef (Total)	2,615.3	2,138.1	2,583.9	2,906.3	2,921.1	3,325.7	3,470.1
<b>% of Total Cattle &amp; Beef Exports</b>	<b>(91.5%)</b>	<b>(86.7%)</b>	<b>(85.0%)</b>	<b>(80.1%)</b>	<b>(81.5%)</b>	<b>(80.1%)</b>	<b>(82.9%)</b>
	<b>Quantity (Live Cattle, 1,000-Head Units; Beef, 1,000 MT)</b>						
Live Cattle	1424.2	1054.9	784.8	742.8	697.2	669.9	779.1
<b>% of Canada's Total Exports</b>	<b>(≈100%)</b>	<b>(≈100%)</b>	<b>(≈100%)</b>	<b>(≈100%)</b>	<b>(≈100%)</b>	<b>(≈100%)</b>	<b>(≈100%)</b>
Beef - fresh/chilled, bone-in	26.9	11.3	18.6	21.7	27.8	32.9	32.9
Beef - fresh/chilled, boneless	227.5	156.4	212.1	255.8	242.2	267.7	272.4
Beef - frozen, bone-in	2.7	4.6	2.8	2.3	1.9	3.0	2.3
Beef - frozen, boneless	13.1	9.1	10.3	9.6	10.6	20.2	23.6
Beef (Total)	270.2	181.4	243.8	289.4	282.5	323.8	331.2
<b>% of Total Beef Exports</b>	<b>(83.4%)</b>	<b>(77.1%)</b>	<b>(78.8%)</b>	<b>(74.9%)</b>	<b>(75.0%)</b>	<b>(73.9%)</b>	<b>(77.0%)</b>

Canada's beef exports to the U.S. have continuously increased, whereas its live cattle exports were noticeably higher in some earlier years. Canada exported 270,200 and 181,500 MT of beef to the U.S. in 2007 and 2013 respectively, compared to 331,200 MT in 2022. In contrast, Canada exported 1.42 and 1.05 million head units of live cattle in 2007 and 2013 respectively, compared to 0.78 million head units in 2022. Also, the composition of Canada's exports to the U.S. has changed significantly. For example, beef constituted 39.0 per cent and 38.7 per cent of Canada's total live cattle and beef exports to the U.S. (in value terms) in 2007 and 2013 respectively,

compared to 73.5 per cent in 2022. In contrast, live cattle accounted for 61.0 per cent and 61.3 per cent of Canada's total live cattle and beef exports to the U.S. (in value terms) in 2007 and 2013 respectively, compared to 26.5 per cent in 2022. These changes could be tied to the expansion of Alberta's meat-packing industry and the increase in the U.S. cattle herd, leading to lower exports of live cattle (and higher exports of beef) to the U.S.

As noted, the U.S. is the main destination for Canada's live cattle and beef exports. Nevertheless, the percentage of live cattle and beef exports to the U.S. from Canada's total live cattle and beef exports has had episodes of moderate decreases. For instance, this percentage stood at 82.9 per cent in value terms in 2022 compared to 91.5 per cent in 2007 and 86.7 per cent in 2013. These changes, albeit moderate, imply a fair tendency to diversify export destinations for Canadian beef, being stimulated by PTAs that reduced trade barriers and by market access strategies that enabled Canada to increase its beef exports to new markets. Most beef exports to the U.S. correspond to the SITC category of fresh/chilled boneless beef, which accounted for 79.3 per cent of the total value of Canada's beef exports to the U.S. in 2022. Also, exports of fresh/chilled bone-in beef (including carcasses and half-carcasses) to the U.S. are important, forming 14.8 per cent of the total value of Canada's beef exports to the U.S. in 2022. Meanwhile, exports of frozen beef to the U.S. remain relatively limited, making up 5.89 per cent of the total value of Canada's beef exports to the U.S. in 2022.

**Japan:** Japan is an important market for Canadian beef and it is second to the U.S. in terms of Canada's bilateral beef exports. Table 4 provides descriptive statistics on Canada's beef exports to Japan for selected years. In 2022, the total value of Canada's beef exports to Japan reached C\$328.1 million current (or C\$263.4 million constant). This value corresponds to a volume of 45,100 MT. In 2022, the Japanese market accounted for 8.1 per cent of Canada's total value of beef exports and 6.4 per cent of Canada's total value of cattle and beef exports. It also represented 10.5 per cent of Canada's total volume of beef exports. Frozen boneless beef is the major exported form of beef to Japan, accounting for 68.1 per cent of the total value of beef exports to Japan (and 76.7 per cent of the total volume of beef exports) in 2022. Also, fresh/chilled boneless beef is another important exporting form, representing 28.4 per cent of the total value of beef exports to Japan (and 19.5 per cent of the total volume of beef exports) in 2022. The statistics reveal significant increases in Canada's beef exports to Japan over the years. For instance, since 2007, the value of Canada's beef exports to Japan increased by 11.9 times in real terms and the corresponding export volume increased by 13.7 times.

**Table 4. Canada's Beef Exports to Japan**

	2007	2013	2016	2019	2020	2021	2022
<b>Value (Million Current C\$)</b>							
Beef - fresh/chilled, bone-in	1.0	<0.05	0.1	0.5	0.3	1.2	3.8
Beef - fresh/chilled, boneless	13.3	11.4	24.1	125.6	99.3	112.1	94.5
Beef - frozen, bone-in	0.6	2.1	1.5	2.3	2.3	1.1	6.4
Beef - frozen, boneless	4.9	32.9	45.2	153.3	142.2	178.2	223.4
Beef (Total)	19.8	46.4	70.9	281.7	244.1	292.6	328.1
<b>% of Total Beef Exports</b>	<b>(1.8%)</b>	<b>(4.1%)</b>	<b>(3.6%)</b>	<b>(9.7%)</b>	<b>(8.3%)</b>	<b>(7.4%)</b>	<b>(8.1%)</b>
<b>% of Total Cattle &amp; Beef Exports</b>	<b>(0.8%)</b>	<b>(1.9%)</b>	<b>(2.3%)</b>	<b>(7.3%)</b>	<b>(6.3%)</b>	<b>(6.1%)</b>	<b>(6.3%)</b>
<b>Value (Million Constant C\$)</b>							
Beef - fresh/chilled, bone-in	1.1	<0.05	0.1	0.5	0.3	1.1	3.0
Beef - fresh/chilled, boneless	14.9	11.5	23.9	117.7	92.6	96.6	75.8
Beef - frozen, bone-in	0.6	2.1	1.5	2.2	2.1	0.9	5.2
Beef - frozen, boneless	5.5	33.3	44.8	143.7	132.5	153.5	179.4
Beef (Total)	22.1	46.9	70.3	264.1	227.5	252.1	263.4
<b>% of Total Beef Exports</b>	<b>(1.8%)</b>	<b>(4.1%)</b>	<b>(3.6%)</b>	<b>(9.7%)</b>	<b>(8.3%)</b>	<b>(7.4%)</b>	<b>(8.1%)</b>
<b>% of Total Cattle &amp; Beef Exports</b>	<b>(0.8%)</b>	<b>(1.9%)</b>	<b>(2.3%)</b>	<b>(7.3%)</b>	<b>(6.3%)</b>	<b>(6.1%)</b>	<b>(6.3%)</b>
<b>Quantity (1,000 MT)</b>							
Beef - fresh/chilled, bone-in	0.2	<0.05	<0.05	<0.05	<0.05	0.1	0.4
Beef - fresh/chilled, boneless	2.0	1.6	2.6	13.1	11.0	11.9	8.8
Beef - frozen, bone-in	0.1	0.4	0.2	0.2	0.2	0.2	1.3
Beef - frozen, boneless	1.0	8.6	11.1	30.1	28.4	32.1	34.6
Beef (Total)	3.3	10.6	13.9	43.4	39.6	44.3	45.1
<b>% of Total Beef Exports</b>	<b>(1.0%)</b>	<b>(4.5%)</b>	<b>(4.5%)</b>	<b>(11.2%)</b>	<b>(10.5%)</b>	<b>(10.1%)</b>	<b>(10.5%)</b>

**Mexico:** Canada is a notable exporter of beef to Mexico. In contrast to the substantial live cattle exports to the U.S., Canada's exports of live cattle to Mexico are minimal. Table 5 provides descriptive statistics on Canada's beef exports to Mexico for selected years. In 2022, the value of beef exports to Mexico stood at C\$160.2 million current (or C\$128.7 million constant), accounting for 3.9 per cent of Canada's total value of beef exports and 3.1 per cent of its total value of live cattle and beef exports. The corresponding beef export volume amounted to 17.3 million MT, accounting for 4.0 per cent of Canada's total volume of beef exports. Most of Canada's beef exports to Mexico are in the form of fresh/chilled boneless beef. There have been some noticeable changes in these exports; they dropped by around two-thirds from 2007 to 2013 but followed gradual increases afterward.

**Table 5. Canada's Beef Exports to Mexico**

	2007	2013	2016	2019	2020	2021	2022
<b>Value (Million Current C\$)</b>							
Beef - fresh/chilled, bone-in	3.7	0.6	1.9	3.0	3.3	7.7	5.1
Beef - fresh/chilled, boneless	117.8	55.8	76.4	106.5	86.9	137.2	153.8
Beef - frozen, bone-in	1.4	0.2	0.6	0.1	0.5	0.1	0.2
Beef - frozen, boneless	4.8	0.3	0.7	0.8	1.0	0.5	1.1
Beef (Total)	127.7	56.9	79.6	110.4	91.7	145.5	160.2
<b>% of Total Beef Exports</b>	<b>(11.3%)</b>	<b>(5.0%)</b>	<b>(4.0%)</b>	<b>(3.8%)</b>	<b>(3.1%)</b>	<b>(3.7%)</b>	<b>(3.9%)</b>
<b>% of Total Cattle &amp; Beef Exports</b>	<b>(5.0%)</b>	<b>(2.3%)</b>	<b>(2.6%)</b>	<b>(2.9%)</b>	<b>(2.4%)</b>	<b>(3.0%)</b>	<b>(3.1%)</b>
<b>Value (Million Constant C\$)</b>							
Beef - fresh/chilled, bone-in	4.1	0.6	1.8	2.8	3	6.6	4.1
Beef - fresh/chilled, boneless	132.2	56.4	75.8	99.9	81	118.2	123.5
Beef - frozen, bone-in	1.6	0.2	0.6	0.1	0.5	0.1	0.2
Beef - frozen, boneless	5.3	0.3	0.6	0.8	0.9	0.4	0.9
Beef (Total)	143.2	57.5	78.8	103.6	85.4	125.3	128.7
<b>% of Total Beef Exports</b>	<b>(11.3%)</b>	<b>(5.0%)</b>	<b>(4.0%)</b>	<b>(3.8%)</b>	<b>(3.1%)</b>	<b>(3.7%)</b>	<b>(3.9%)</b>
<b>% of Total Cattle &amp; Beef Exports</b>	<b>(5.0%)</b>	<b>(2.3%)</b>	<b>(2.6%)</b>	<b>(2.9%)</b>	<b>(2.4%)</b>	<b>(3.0%)</b>	<b>(3.1%)</b>
<b>Quantity (1,000 MT)</b>							
Beef - fresh/chilled, bone-in	1.2	0.1	0.2	0.3	0.3	0.7	0.4
Beef - fresh/chilled, boneless	30.8	11.3	11.4	13	11.1	14.6	16.8
Beef - frozen, bone-in	0.6	0	0.1	0	0.1	0	0
Beef - frozen, boneless	1.2	0.1	0.1	0.1	0.2	0.1	0.1
Beef (Total)	33.8	11.5	11.8	13.4	11.7	15.4	17.3
<b>% of Total Beef Exports</b>	<b>(10.4%)</b>	<b>(4.9%)</b>	<b>(3.8%)</b>	<b>(3.5%)</b>	<b>(3.1%)</b>	<b>(3.5%)</b>	<b>(4.0%)</b>

**South Korea:** South Korea is an emerging market for Canadian beef. Table 6 shows that the value of Canada's beef exports to South Korea attained C\$171.1 million current (or C\$137.3 million constant) in 2022, accounting for 4.2 per cent of Canada's total value of beef exports and 3.3 per cent of its total value of live cattle and beef exports. In terms of volume, Canada exported 16.3 million MT of beef to South Korea in 2022, representing 3.8 per cent of its total volume of beef exports. Significant growth has been observed over time, starting from negligible quantities in earlier years. Most of these beef exports are in the form of frozen (bone-in and boneless) beef.

**Table 6. Canada's Beef Exports to South Korea**

	2007	2013	2016	2019	2020	2021	2022
<b>Value (Million Current C\$)</b>							
Beef - fresh/chilled, bone-in	0.0	0.4	0.3	0.1	0.1	0.9	0.8
Beef - fresh/chilled, boneless	0.0	0.4	0.2	5.1	5.0	9.8	2.0
Beef - frozen, bone-in	0.0	5.2	22.0	21.0	24.0	48.3	97.2
Beef - frozen, boneless	0.0	0.6	17.6	14.3	13.9	55.9	71.1
Beef (Total)	0.0	6.6	40.1	40.5	43.0	114.9	171.1
<b>% of Total Beef Exports</b>	<b>(0.0%)</b>	<b>(0.6%)</b>	<b>(2.0%)</b>	<b>(1.4%)</b>	<b>(1.5%)</b>	<b>(2.9%)</b>	<b>(4.2%)</b>
<b>% of Total Cattle &amp; Beef Exports</b>	<b>(0.0%)</b>	<b>(0.3%)</b>	<b>(1.3%)</b>	<b>(1.0%)</b>	<b>(1.1%)</b>	<b>(2.4%)</b>	<b>(3.3%)</b>
<b>Value (Million Constant C\$)</b>							
Beef - fresh/chilled, bone-in	0.0	0.4	0.3	0.1	0.1	0.7	0.6
Beef - fresh/chilled, boneless	0.0	0.5	0.2	4.8	4.6	8.4	1.6
Beef - frozen, bone-in	0.0	5.3	21.9	19.7	22.3	41.6	78.0
Beef - frozen, boneless	0.0	0.6	17.5	13.4	13.0	48.2	57.1
Beef (Total)	0.0	6.8	39.8	38.0	40.0	98.9	137.3
<b>% of Total Beef Exports</b>	<b>(0.0%)</b>	<b>(0.6%)</b>	<b>(2.0%)</b>	<b>(1.4%)</b>	<b>(1.5%)</b>	<b>(2.9%)</b>	<b>(4.2%)</b>
<b>% of Total Cattle &amp; Beef Exports</b>	<b>(0.0%)</b>	<b>(0.3%)</b>	<b>(1.3%)</b>	<b>(1.0%)</b>	<b>(1.1%)</b>	<b>(2.4%)</b>	<b>(3.3%)</b>
<b>Quantity (1,000 MT)</b>							
Beef - fresh/chilled, bone-in	0.0	<0.05	0.1	<0.05	<0.05	0.1	0.1
Beef - fresh/chilled, boneless	0.0	0.1	<0.05	0.5	0.4	0.7	0.1
Beef - frozen, bone-in	0.0	0.8	3.7	3.4	3.9	5.8	9.7
Beef - frozen, boneless	0.0	0.1	2.4	1.5	2.1	6.0	6.4
Beef (Total)	0.0	1.0	6.2	5.4	6.4	12.6	16.3
<b>% of Total Beef Exports</b>	<b>(0.0%)</b>	<b>(0.4%)</b>	<b>(2.0%)</b>	<b>(1.4%)</b>	<b>(1.7%)</b>	<b>(2.9%)</b>	<b>(3.8%)</b>



**China, Vietnam and the Philippines:** Table 7 presents the value and volume of Canada's total beef exports to some other destination countries. China (including Hong Kong and Macao special administrative regions (SARs)) has been conventionally an important and promising market for Canadian beef, with an export value attaining C\$262.3 million current in 2021 (or C\$225.9 million constant) and an export volume of 25,100 MT in 2021. However, significant declines occurred in 2022 as China restricted the importation of Canadian beef following the detection of an atypical BSE case in Alberta in December 2021 (more details in the following section).

**Table 7. Canada's Total Beef Exports to Main Destination Countries**

	2007	2013	2016	2019	2020	2021	2022
<b>Value (Million Current C\$)</b>							
U.S.	909.4	817.9	1,519.6	2,126.4	2,245.3	2,985.3	3,177.2
Japan	19.8	46.4	70.9	281.7	244.1	292.6	328.1
Mexico	127.7	56.9	79.6	110.4	91.7	145.5	160.2
South Korea	0.0	6.6	40.1	40.5	43.0	114.9	171.1
China (incl. Hong Kong & Macao)	53.7	169.1	212.2	253.0	207.9	262.3	42.0
Vietnam	0.5	1.8	1.7	8.0	40.8	70.5	89.9
Saudi Arabia and UAE	<0.05	15.4	27.2	15.1	20.6	19.1	48.2
EU	8.9	8.5	5.6	11.6	16.8	25.7	26.6
U.K.	<0.05	2.4	<0.05	20.3	17.7	7.6	<0.05
Other Countries	7.1	16.9	22.4	29.5	27.0	22.8	23.9
<b>Value (Million Constant C\$)</b>							
U.S.	1,020.5	826.5	1,508.2	1,993.6	2,092.3	2,572.2	2,550.5
Japan	22.1	46.9	70.3	264.1	227.5	252.1	263.4
Mexico	143.2	57.5	78.8	103.6	85.4	125.3	128.7
South Korea	0.0	6.8	39.8	38.0	40.0	98.9	137.3
China (incl. Hong Kong & Macao)	60.2	170.8	210.5	237.2	193.7	225.9	33.7
Vietnam	0.5	1.8	1.7	7.5	38.0	60.7	72.1
Saudi Arabia and UAE	<0.05	15.5	27.0	14.2	19.2	16.5	38.8
EU	9.9	8.6	5.6	10.9	15.6	22.1	21.3
U.K.	<0.05	2.4	<0.05	19	16.5	6.6	<0.05
Other Countries	8.6	17.0	22.7	27.8	25.5	20.0	19.1
<b>Quantity (1,000 MT)</b>							
U.S.	270.2	181.4	243.8	289.4	282.5	323.8	331.2
Japan	3.3	10.6	13.9	43.4	39.6	44.3	45.1
Mexico	33.8	11.5	11.8	13.4	11.7	15.4	17.3
South Korea	0.0	1.0	6.2	5.4	6.4	12.6	16.3
China (incl. Hong Kong & Macao)	13.7	25.4	27.9	26.5	22.4	25.1	3.4
Vietnam	0.2	0.3	0.2	1.3	7.0	10.2	9.7
Saudi Arabia and UAE	<0.05	1.6	2.3	1.2	1.5	1.5	2.7
EU	1.1	0.7	0.4	0.6	1.0	1.5	1.4
U.K.	<0.05	0.2	<0.05	1.7	1.4	0.7	<0.05
Other Countries	1.5	2.6	2.7	3.4	3.3	3.2	3.0

Some important growth in exports to Vietnam and the Philippines have compensated for the decrease in beef exports to China. In 2022, Canada's beef exports to Vietnam stood at C\$89.9 million current (or C\$72.1 million constant) with a corresponding volume of 9,700 MT. These increases were stimulated by the implementation of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in December 2018, which granted Canadian beef duty-free access to the Vietnamese market (more details in the following section). Also, Canada's beef exports to the Philippines amounted to C\$4.9 million current (or C\$3.9 million constant) with a corresponding volume of 1,000 MT. The predominant form of beef exports to Southeast Asian countries is frozen, primarily due to inadequate storage infrastructure.

**Other Markets:** The Gulf Cooperation Council (GCC) zone is another important market for Canadian beef. In 2022, Canada's beef exports to Saudi Arabia and the UAE stood at C\$48.2 million current (or C\$38.8 million constant) with a corresponding volume of 2.7 million MT. The Canadian beef exported to the GCC zone requires mandatory halal certification before entering the markets of member countries.<sup>12</sup> The predominant proportion of Canadian beef supplied to GCC countries is distributed through food service and catering in hotels and restaurants.

Canada's beef exports to the EU and the U.K. have been limited despite the effective PTAs between Canada and these two markets.<sup>13</sup> The EU and the U.K. continue to uphold restrictions on the importation of beef from carcasses washed with PAA and hormone-treated beef (more details in the following section).

Last, Canada's beef exports to Taiwan are worth noting. While the UN Comtrade database does not explicitly report trade data for Taiwan due to political reasons, the statistics for the category "other Asia, not elsewhere specified" are considered good proxies for Taiwan's trade data. According to these statistics, Canada's beef exports to Taiwan stood at C\$12.5 million current (or C\$10 million constant) in 2022, with a corresponding net weight of 1,000 MT.

## ENHANCING CANADA'S BEEF EXPORTS: CHALLENGES AND OPPORTUNITIES

Some general strategies that are not specific to importing countries would effectively bolster the export potential and enhance the competitive advantage of Canadian beef in international markets. These strategies have been outlined in Canada's National Beef Strategy 2020-2024 (Canadian Beef Strategy 2022). Promoting research and development and fostering innovation in the sector, while integrating modern technology into production processes, would lead to reduced production costs and enhance the competitive advantage of Canadian beef in global markets. Also, implementation of regulatory frameworks that support the sector's functioning, along with expanding the availability of labour resources and accessibility to essential inputs such as cattle feed, would facilitate the sector's operation. Moreover, efficient communication with domestic and international consumers, promotion of Canadian beef and sustained supply and business networks are significant pillars in raising Canada's competitiveness in international markets.

Besides these general strategies, market access is critical for Canada's beef exports. Therefore, it is essential to comprehend the distinct challenges encountered in beef exports to each market

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<sup>12</sup> According to Islamic law, Muslims should only consume beef (and meat in general) that has been blessed and slaughtered in accordance with Sharia guidelines. The significance of the halal certification is further emphasized by the growing global Muslim population and by emerging beef markets with large Muslim populations.

<sup>13</sup> These PTAs include the Canada-EU Comprehensive Economic and Trade Agreement (CETA) in the case of the EU, and the Canada-U.K. Trade Continuity Agreement (Canada-U.K. TCA) and the CPTPP in the case of the U.K. See the next section for more details.

and to design specific strategies to mitigate their implications. It is also important to adopt diversification strategies in exporting to new markets while maintaining/increasing beef exports to conventional markets. The main conditions facing Canada's beef exports to major international markets are examined next.

**United States:** The Canadian beef industry has generally benefited from preferential market access for its exports. At the regional level, NAFTA initially granted duty-free access for Canadian beef and live cattle to the U.S. market and it has established dispute settlement procedures and rules of origin in international trade. The Canada-U.S.-Mexico Agreement (CUSMA), which superseded NAFTA on July 1, 2020, has maintained free market access for Canadian beef and live cattle. It has also preserved the dispute settlement procedures and rules of origin in international trade. Like its predecessor, this new trade agreement does not comprise the CoOL regulation, which mandates retailers to inform consumers about the country of origin of relevant commodities (primarily fresh/chilled and frozen beef, pork and lamb).

The CoOL regulation has been a contentious issue for Canadian beef and cattle producers. The CoOL requirements for beef, pork and lamb were initially introduced through the *Farm Security and Rural Investment Act* of 2002, also known as the Farm Bill, which is basically an amendment to the *Agricultural Marketing Act* of 1946.<sup>14</sup> The 2016 *Consolidated Appropriations Act*, ratified by Congress in 2015, included provisions that essentially eliminated the CoOL requirements for beef and pork. Consequently, the U.S. Department of Agriculture (USDA) has decided to cease enforcing the CoOL requirements specifically for beef and pork. However, the CoOL regulation continues to be upheld for other agricultural commodities, such as chicken, lamb, goat and peanuts.

The CoOL regulation has often been perceived as an implicit non-tariff barrier (or a hidden protectionist tool) that favours the U.S. beef and cattle industry and disadvantages Canadian and Mexican producers. CUSMA's continuing exclusion of the CoOL regulation is economically beneficial. This is consistent with many initial studies, which showed that the mandatory CoOL regulation would generate significant costs and lead to welfare losses, particularly for consumers (Lusk and Anderson 2004; Awada and Yiannaka 2012; Yeboah et al. 2016) and would lessen the competitiveness of Canadian and Mexican cattle and beef producers in the U.S. market (Bown and Brewster 2017).

There have been some recent political bids to reinstate the CoOL requirements for beef products. For instance, in January 2023, Senators John Thune and Mike Rounds of South Dakota, Jon Tester of Montana and Cory Booker of New Jersey proposed the *American Beef Labeling Act*, which would mandate the CoOL for beef in U.S. grocery stores. This bill would prompt the U.S. Trade Representative (USTR) to consult with the United States Department of Agriculture (USDA) in formulating an appropriate plan that aligns with the regulations of the World Trade Organization's (WTO) rules. In August 2023, Representatives Harriet Hageman of Wyoming and Ro Khanna of California introduced a companion bill, the *Country-of-Origin Labeling Enforcement Act*, which would define U.S.-produced beef as "exclusively born, raised, slaughtered and packaged in the United States." These proposed bills came along with the proposed USDA rule that allows for the voluntary "Product of USA" label for beef when the meat is exclusively produced from cattle born, raised, slaughtered and processed in the U.S. Although this labelling is meant to be voluntary, Canadian producers perceive this rule as discriminatory since it encompasses a comparable criterion to the repealed mandatory CoOL and requires meat packers and processors

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<sup>14</sup> Twine et al. (2016) found that the CoOL requirements led to significant structural change in the patterns of Canada's beef and live cattle trade with the U.S.

to segregate cattle originating from Canada (Canadian Meat Council 2023).<sup>15</sup> Consequently, there would be additional segregation costs and, eventually, adverse implications for Canada's cattle and beef exports to the U.S. Implementing such policies would undermine CUSMA's significance in promoting cattle and beef trade among member countries.

Canadian policy-makers, advocacy groups and producers should remain observant and active amid these various endeavours toward restoring some forms of CoOL. Accordingly, they are advised to continuously emphasize the costs and welfare losses associated with the CoOL requirements within the highly integrated North American cattle/beef market and supply chain through appropriate political, diplomatic and economic channels.

**European Union:** Canada's beef exports to the EU have endured a contentious phase due to the EU's ban on the importation of hormone-treated beef.<sup>16</sup> This dispute, which started in 1996,<sup>17</sup> was settled through the Canada-EU Comprehensive Economic and Trade Agreement (CETA), which took effect on September 21, 2017. This PTA has granted annual duty-free TRQ access for hormone-free beef produced in Canada, amounting to a total of 50,000 MT of beef (35,000 MT of fresh/chilled beef and 15,000 MT of frozen beef) from 2022 onward.<sup>18</sup> In order to benefit from the CETA preferences, Canadian producers must conform to the rules of origin, ensuring that the exported beef is entirely originated in Canada. Also, Canada's beef exports must still abide by the existing EU standards and regulations, such as the ban on the importation of beef from carcasses washed with PAA, and hormone-treated beef. As a result, Canada's beef exports remain below the TRQ threshold. For example, in 2022, Canada exported 1,400 MT of beef to the EU for a value of C\$26.6 million current (or C\$21.3 million constant). In comparison, the EU exported 10,200 MT of beef to Canada in 2022, at a value of C\$78.9 million current (or C\$63.3 million constant). These statistics reveal trade imbalances stemming from the technical trade barriers that generate additional costs to the Canadian cattle/beef sector in adapting production processes and slaughter plants to the EU's regulations. These barriers derive from the EU's export requirements and safety procedures, such as banning the importation of beef/carcass rinsed with PAA (Arnason 2023).<sup>19</sup> This meat-washing practice is common in Canadian slaughter plants to reduce microbiological surface contamination. Consequently, the EU's preferences for Canadian beef would not reach the export potential in the presence of such technical barriers to trade. Continuous efforts should be directed toward inducing the European Commission to recognize the Canadian food safety system and to approve meat/carcasses washed with PAA (and perhaps hormone-treated beef).<sup>20</sup> These endeavours would be naturally bolstered by scientific substantiation about the safety of PAA use in the meat industry and by economic evidence of the benefits of an equitable bilateral trading system between Canada and the EU. In the event of a persistent ban on the importation of meat from PAA-rinsed carcasses, this case could be eventually disputed at the WTO. Also, the Canadian cattle/beef industry would benefit from

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<sup>15</sup> This proposed regulation would also broaden the coverage to include processed product and food services (Canadian Meat Council 2023).

<sup>16</sup> Agriculture and Agri-Food Canada (AAFC) has approved the use of six hormones, three of which are natural (estradiol-17 $\beta$ , progesterone and testosterone), and three of which are synthetic (melengestrol acetate, trenbolone acetate and zeranol).

<sup>17</sup> Canada and the U.S. contended that the imposition of this prohibition lacked definitive scientific substantiation and represented an implied form of protectionism (Hobbs 2014). In 1996, they challenged this ban through the WTO's dispute settlement system. Consequently, they were granted permission to enforce trade sanctions on selected EU agricultural products. These sanctions were implemented in July 1999.

<sup>18</sup> Also, Canada could share supplementary duty-free beef exports with the U.S. to the EU market through the joint Hilton beef quota (for a total amount of 14,950 MT).

<sup>19</sup> This is in addition to the ongoing ban on the importation of hormone-treated beef. Soon and Thompson (2019) found that the removal of the EU's sanitary and phytosanitary (SPS) measures that ban the importation of hormone-treated beef would lead to significant increases in Canada's beef exports to the EU.

<sup>20</sup> The Canadian government has applied to the European Food Safety Authority (EFSA) to request a comprehensive evaluation of the PAA's safety for use in the meat industry.

promoting its beef in the EU market as a high-quality, nutritious and safe product and countering any biased consumer perceptions and fallacies about Canadian beef products and the industry.

**CPTPP Countries:** The CPTPP is a trade agreement that includes Canada, Australia, Brunei, Chile, Japan, Malaysia, Mexico, New Zealand, Peru, Singapore and Vietnam. This agreement came about when the U.S. exited the preceding Trans-Pacific Partnership (TPP), and it became effective on December 30, 2018. The CPTPP's membership has further increased with the U.K.'s accession on July 16, 2023. The agreement comprises preferential access for Canadian beef to large markets and it sets rules of origin for products to be eligible for this access. The CPTPP has raised the competitiveness of Canadian beef in the Japanese market vis-à-vis other exporting countries, such as Australia, through successive decreases in tariff rates. For instance, following the CPTPP's implementation, the tariff rate on fresh/chilled and frozen beef was reduced from 38.5 per cent to 23.35 per cent in April 2023 and it will phase down to 9.0 per cent by 2033.<sup>21</sup> Thus, the CPTPP has placed Canada at tariff parity with major beef-exporting countries. It is worth noting that if beef imports increase significantly, Japan will increase tariffs when the total value of beef imports from CPTPP countries surpasses 601,800 MT.

The CPTPP has also reduced tariffs on Canada's beef exports to other member countries. This agreement granted duty-free access for Canadian beef to the Vietnamese market, in contrast to the pre-agreement rate of 31.0 per cent. Also, Peru's tariff rate will be phased out from 17.0 per cent to duty-free access by 2030. Meanwhile, the CPTPP's effects on Canada's beef exports to Mexico have been limited, given that these two countries already have CUSMA, which grants duty-free access. Beef exports to CPTPP members (namely, Australia, Chile, New Zealand and Malaysia) continue to benefit from duty-free market access.

The U.K.'s accession to the CPTPP has caused tensions stemming from the asymmetries in the beef-trading relationship between Canada and the U.K. The Canadian producers have continually emphasized that the CPTPP does not resolve the trade barriers the U.K. imposed on imports of Canadian beef. The U.K. does not fully accept the safety of the Canadian meat production/inspection system and does not approve the PAA carcass-wash (Canadian Cattle Association 2023).<sup>22</sup> This restriction comes in addition to the ongoing U.K. ban on the importation of hormone-treated beef. In contrast, Canada grants full market access to beef from the U.K.

The U.S. has sought PTA with Japan outside the CPTPP. As a result, the U.S.-Japan Trade Agreement (USJTA), which was implemented on January 1, 2020, has added another spin to the beef trade's dynamics. Under this parallel trade agreement, tariff rates Japan sets on U.S. beef will decrease from 38.5 per cent to 9.0 per cent over 15 years, putting the U.S. at a tariff parity with the CPTPP beef-exporting countries.<sup>23</sup> As in the case of beef imports from CPTPP countries, Japan maintains a safeguard threshold set at 242,000 MT, above which it would raise tariffs on supplementary amounts. This threshold is notably smaller than that set for beef imports from CPTPP member countries (601,800 MT). Consequently, the higher safeguard thresholds for beef coming from CPTPP countries will disadvantage the U.S. and principally favour Australia, which accounts for the highest share of beef exports to Japan among CPTPP member countries (Muhammad et al. 2021).

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<sup>21</sup> Also, the tariff rate on Canada's exports of a range of bovine offal products will phase down from 50.0 per cent to 9.0 per cent by 2033.

<sup>22</sup> This technical issue continues to dictate Canada's beef exports to the U.K. despite the Canada-U.K. TCA that went into effect in April 2021.

<sup>23</sup> Also, tariffs on certain beef offal products will be eliminated over eight to 10 years.

**South Korea:** Canada has bilateral trade agreements with a few other countries that represent important markets for Canadian beef. The Canada-Korea Free Trade Agreement (CKFTA), which came into force on January 1, 2015, encompassed preferential access for Canadian beef to the South Korean market as expressed through a gradual elimination of the 40.0 per cent tariff on beef over a phase-out period of 15 years. However, on December 21, 2021, South Korea suspended imports of Canadian beef following the atypical BSE case in Alberta. This import suspension was lifted on January 19, 2022. The phasing-out tariff rate facing Canadian beef exports to South Korea stood at 16.0 per cent in 2023 compared to tariff rates of 13.3 per cent and 8.0 per cent on Australian and U.S. beef respectively. Canada's beef exports to South Korea are significantly smaller compared to beef exports from other countries,<sup>24</sup> implying that the Canadian sector must enhance its competitiveness to acquire larger market shares in South Korea.

**China (including Hong Kong and Macao SARs):** Over the last few decades, China's economic growth has been accompanied by notable shifts in the dietary preferences of Chinese consumers and in their lifestyles, leading to increased beef consumption. As a result, China, including Hong Kong and Macao, became the top-ranked beef importer and it currently accounts for over 30 per cent of global beef imports. The majority of China's beef imports are sourced from Brazil, amounting to around 46.2 per cent of China's total beef imports in value (or 46.1 per cent of China's total beef imports in volume) in 2022.<sup>25</sup> China also imports a significant amount of beef from:

1. Argentina and Uruguay, which respectively represent 17.9 per cent and 9.4 per cent of China's total beef imports in value (or 12.9 per cent and 8.4 per cent of China's total beef imports in volume) in 2022; and
2. Australia, New Zealand and the U.S., which respectively account for 6.7 per cent, 8.0 per cent and 8.5 per cent of China's total beef imports in value (or 8.6 per cent, 7.7 per cent and 13.0 per cent of China's total beef imports in volume) in 2022.

China is currently not among the top destination countries for Canada's beef exports, which only represent 0.13 per cent of China's total beef imports in value (or 0.18 per cent of its total beef imports in volume). Yet, a wide prospect remains to raise Canada's competitiveness vis-à-vis other beef-exporting countries and to enhance its beef exports to China. Some initial attempts have been made to launch consultations about a potential PTA between China and Canada that resembles the China-Australia Free Trade Agreement (ChAFTA), which mandated the elimination of China's tariffs on Australian beef by January 1, 2024. However, those initial endeavours were halted in 2018 following the political rift between Canada and China after Canadian authorities arrested Meng Wanzhou, chief financial officer of Huawei Technologies, and the subsequent detention of two Canadian citizens in China.

An additional complicating factor has had a negative impact on Canadian beef's access to the Chinese market. An atypical BSE case in Alberta in December 2021 initially prompted some countries, including China, South Korea and the Philippines, to impose a ban on Canadian beef imports. These restrictions were rescinded in January 2022, except for China, which continues to uphold this prohibition. There have been unsuccessful industrial and political efforts to prompt the Chinese government to overturn this ban (McCuaig 2023a, 2023b). Considering that similar restrictions on beef imports from other countries have been lifted within a short time,<sup>26</sup> it is often

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<sup>24</sup> Canada's beef exports to South Korea stood at 16,200 MT in 2022. In comparison, beef exports from the U.S. and Australia to South Korea amounted to 282,100 and 163,400 MT respectively.

<sup>25</sup> The value-based percentages cover beef trade values and exclude live cattle imports.

<sup>26</sup> For instance, in a CBC interview, Dennis Laycraft, executive vice-president of the Canadian Cattle Association, noted that China's restrictions on beef imports from Ireland and Brazil following the discovery of atypical BSE cases in these countries were lifted within a few weeks (Stephenson 2023).

speculated that political factors primarily drive China's continuing ban (Stephenson 2023). Nevertheless, the ongoing closure of the Chinese market has been compensated by the CKFTA-driven increases in Canada's beef exports to South Korea and the CPTPP-driven increases in exports to Japan and other member countries.

**United Kingdom:** The beef-trading relationship between Canada and the U.K. remains contentious because of the British government's reluctance to permit the importation of beef treated with growth hormone and beef derived from PAA-washed carcasses. The latter restriction is often perceived as a continuity of the beef-import policy that was adopted during the U.K.'s membership in the EU. This issue has been exacerbated by the U.K.'s accession to the CPTPP, as the U.K. continues to uphold those requirements which are de facto technical barriers facing Canada's beef exports to the U.K. The Canadian sector has been emphasizing the lopsided beef-trading relationship between Canada and the U.K. and has been advocating for market access reciprocity.

**GCC Countries:** Canada's beef exports to the GCC countries (namely, Saudi Arabia and the UAE) pale when compared to beef exports from other countries, such as Brazil, India and Australia. These modest beef-export levels occur despite the fact that the Canadian sector has acquired the halal certification that many organizations provide. They are also likely associated with higher transaction costs and inadequate marketing, advertising and business networks.<sup>27</sup> Thus, the Canadian sector is encouraged to overcome these deficiencies to enhance its access to these (and other) Muslim-majority markets and to set a long-term market access strategy to benefit from the growing global Muslim population that principally consumes halal meat.

**The Philippines and Taiwan:** Canada's beef exports to the Philippines resumed in January 2022 after temporary import restrictions were lifted following the atypical Alberta BSE case in late 2021. Nevertheless, Canada trails many other countries, such as Brazil, India, Australia and the U.S., in beef exports to the Philippines. However, Canada does export a considerable amount of beef offal, which is a common ingredient in Filipino cuisine, to the Philippines (around 2,700 MT in 2022). Also, Taiwan fully opened its market to Canadian beef in June 2023 by removing the last remaining ban on the importation of beef from cattle older than 30 months. This ban is tied to the initial 2003 BSE case.<sup>28</sup> The value of Canada's beef exports to Taiwan is significantly smaller compared to other beef-exporting countries; namely, the U.S., Paraguay, Australia and New Zealand. The current trade conditions imply that there is a potential to increase Canada's beef exports to the Philippines and Taiwan by mitigating supply and transaction costs and overcoming inadequacies in business networks, marketing and distribution.

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<sup>27</sup> Canada's beef exports to many other Muslim-majority countries, such as Algeria, Egypt and Jordan are negligible.

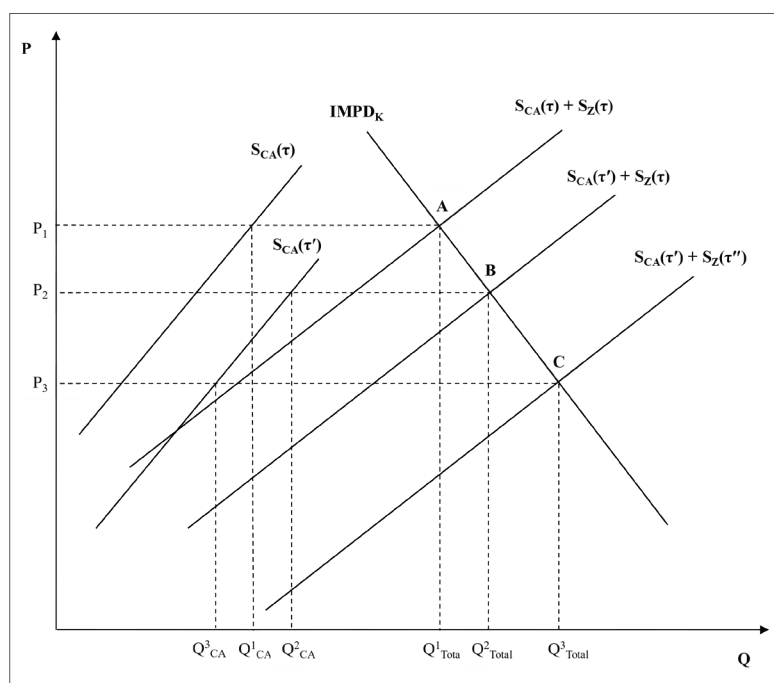
<sup>28</sup> In 2016, Taiwan dropped the ban on the importation of Canadian beef from cattle younger than 30 months.

## CANADA'S COMPETITIVENESS IN BEEF-EXPORTING MARKETS: SOME FURTHER CONSIDERATIONS

Canada's beef exports to many international markets lag behind those of other beef-exporting countries. For instance, Canada's beef exports to South Korea stood at 16,200 MT in 2022. In comparison, beef exports from the U.S. and Australia to South Korea amounted to 282,100 and 163,400 MT respectively. That is, despite the CKFTA trade preferences, the ratios of Canada's beef exports to beef exports of these countries trail at ratios of 0.06 and 0.10 in volume respectively. Also, the volume of Canada's beef exports to Taiwan was 9,600 MT in 2022 compared to significant amounts of exports from the U.S., Paraguay and Australia, which attained 746,100, 203,800 and 196,000 MT respectively. Many factors such as trade costs, technical barriers, transaction costs and marketing and distribution costs contribute to explaining these outcomes. Increasing Canada's beef exports would require reducing these costs and an upgrade of its relative competitiveness in these international markets.

Figure 5 presents a graphical illustration through the partial equilibrium framework of Pomfret (1986), which depicts the upward-sloping export supply schedules of two exporting countries and the import demand schedule of a destination country. Let  $S_{CA}(\tau)$  and  $S_Z(\tau)$  represent the beef export supply schedules of Canada (CA) and country Z, with an aggregate export supply schedule of  $S_{CA}(\tau)+S_Z(\tau)$ . Also, let  $IMPD_K$  represent the import demand schedule of the destination country K.<sup>29</sup> For demonstration purposes, exports from Canada and country Z are assumed to be initially facing an equivalent cost of trade barriers denoted by " $\tau$ ". In this case, the equilibrium occurs at point A – at the intersection between the aggregate supply curve of Canada and country Z and the import demand schedule of country K. The equilibrium price initially stands at  $P_1$ , and the total volume of beef exports to country K amounts to  $Q^1_{Total}$ , of which  $Q^1_{CA}$  comes from Canada and  $(Q^1_{Total}-Q^1_{CA})$  comes from country Z.

**Figure 5. Graphical Illustration of Canada's Beef Exports to a Destination Market**



<sup>29</sup> This demand schedule is determined by subtracting the domestic beef supply schedule of country K from the beef demand schedule of country K.



Next, assume that Canada and country K get engaged in a PTA, whereby Canadian beef products are granted preferential access to country K's market. The cost of trade barriers decreases to  $\tau' < \tau$ . Consequently, Canada's export supply curve shifts rightward to  $S_{CA}(\tau')$ , leading to a rightward shift in the aggregate export supply curve to  $S_{CA}(\tau') + S_Z(\tau)$ . The new equilibrium occurs at point B, where Canada's beef exports increase to  $Q_{CA}^2$ . The total volume of beef exports to country K attains  $Q^2$  with an equilibrium beef price of  $P_2 < P_1$ .

This graphical illustration becomes intriguing when assuming that country Z and country K get subsequently engaged in a PTA whereby country Z's beef exports benefit from a more pronounced preferential access to country K's market. As a result, the cost of trade barriers facing country Z's beef exports to country K decreases to  $\tau'' < \tau' < \tau$ . The new equilibrium now occurs at point C, and the total volume of beef exports to country K rises to  $Q^3$ . However, Canada's beef exports fall to  $Q_{CA}^3$  in this scenario despite the existing preferences. Hence, a certain amount of Canada's beef exports to country K has been substituted by the increases in country Z's exports. This scenario underlines the importance of considering the relative significance of Canada's preferential market access vis-à-vis trade preferences that are granted to other beef-exporting countries.

This graphical analysis could also illustrate the effects of transaction, marketing and distribution costs when assumed to be incurred by the exporter. In this case, " $\tau$ " would represent the equivalent rate of these costs and would act as a tax on supply. Then, decreases in transaction, marketing and distribution costs would induce rightward shifts in the export supply curves and the analysis proceeds as in the previous representation that depicts the cost of trade barriers. Accordingly, this illustration implies that Canada would sustain/promote its competitiveness in destination markets by decreasing transaction, marketing and distribution costs not only in absolute terms but also in relative terms vis-à-vis other beef-exporting countries.<sup>30</sup>

## DISCUSSION

Canada's beef exports have consistently benefited from decreases in trade costs and from PTAs. The latter have induced significant phase-out reductions in tariffs and improvements in business networks with PTA partners. Nevertheless, the effectiveness of several PTAs has been considerably lessened by NTMs applied by Canada's PTA partners, hindering Canada's beef exports and countering the prospects brought about by trade preferences. Also, the Canadian cattle/beef sector has been facing significant competition from other beef-exporting countries in several international markets, leading to lower market shares.

The U.S. is Canada's natural trading partner and the principal international market for Canada's live cattle and beef exports. This trading relationship must be sustained and the diversification strategies in export destinations of Canadian beef should aim at complementing (not substituting for) the Canada-U.S. cattle/beef trading relationship. The recent PTAs with more distant countries should not decelerate the drive to preserve the highly integrated supply chain in North America. The Canadian government and cattle/beef advocacy groups should monitor the U.S.'s current political activities, aiming at reactivating the CoOL regulations to encompass beef. It is imperative to establish transparent communication with relevant U.S. government representatives, politicians and policy-makers via diplomatic/political and economic channels to elucidate the CoOL regulations' adverse impacts on the North American cattle/beef market and supply chain, and

<sup>30</sup> Similarly, increased productivity and technological improvement would lead to a rightward shift in the export supply curves (Ghazalian 2013). Thus, the volume of Canada's beef exports at equilibrium is also a function of the relative rightward shift in country Z's export supply curve.

consumers. It is also crucial to quantify the welfare losses that would be incurred as a direct consequence of reinstating the mandatory CoOL regulations.

Several challenges face Canada's beef exports to other countries. Despite CETA and the Canada-U.K. TCA, Canada's exports to the EU and the U.K. are beset by double-layer NTMs that ban the importation of meat from hormone-treated beef and carcasses treated with PAA. The increase in the EU's annual duty-free TRQs is inadequate in enhancing access to the large EU market and overcoming the NTMs. Also, the U.K.'s admission to the CPTPP did not prompt a reassessment of its NTMs on Canadian beef. The Canadian government and cattle/beef advocacy groups should consistently strive to persuade the European Commission to acknowledge the Canadian food safety system and remove technical restrictions on Canadian beef. It is essential to provide scientific and economic evidence about the mutual benefits of opening the EU and U.K. markets to Canadian beef.

There are significant opportunities for Canadian beef in the large Chinese market, which has been characterized by consumers changing their diets toward more beef consumption. However, the continuing ban on the importation of Canadian beef since late 2021, following the Alberta BSE case, has altered access to the Chinese market. While the prospect of a trade agreement between China and Canada looks distant at the moment given current bilateral and global political conditions, the cattle/beef advocacy groups should compel the Canadian government and diplomatic agents to adopt strategies that transcend the political rift to re-establish the regular beef trading patterns and enhance access to the Chinese market. Prior to the rift that arose in 2018, Canada's beef exports to China covered a small fraction of the market share when compared to the beef exports of other countries. Thus, there are broad opportunities to increase beef exports to the Chinese market once the ban is lifted. To raise Canada's beef exports, it would be necessary to adopt measures aiming at reducing trade costs, promoting Canadian beef to Chinese consumers and improving Canada's competitive position vis-à-vis other beef-exporting countries.

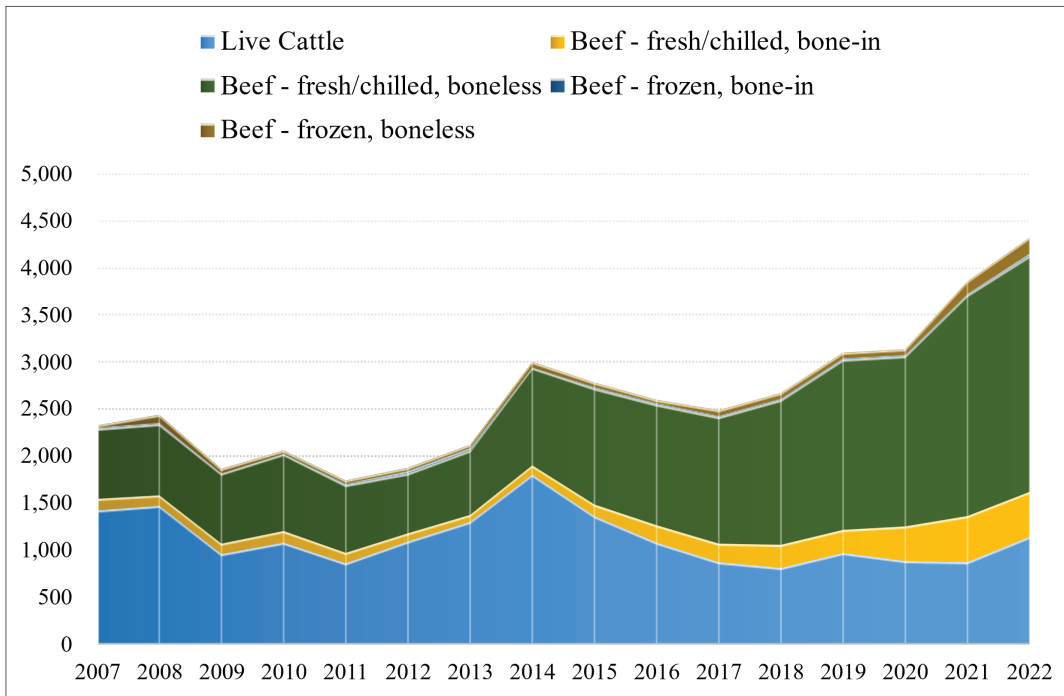
Canada's beef exports to Japan and South Korea are significant and the CPTPP and the CKFTA have further promoted them. The Philippines and Taiwan are also emerging among the promising markets for Canada's beef exports following the removal of the import restrictions put in place after the atypical Alberta BSE case. However, Canada's beef exports to these countries are significantly lower compared to other countries' beef exports. This situation emphasizes the necessity of raising competitiveness in these markets by upgrading business/supply networks, reducing trade costs and presenting Canadian beef as a safe and high-quality product. Also, the Canadian sector should benefit from the established halal certification system by promoting its beef in Muslim-majority markets. Therefore, it is important for the sector to develop a comprehensive market access strategy that capitalizes on the expanding worldwide Muslim population's demand for halal meat and to enhance Canada's competitiveness vis-à-vis other halal beef-exporting countries.

## CONCLUDING REMARKS

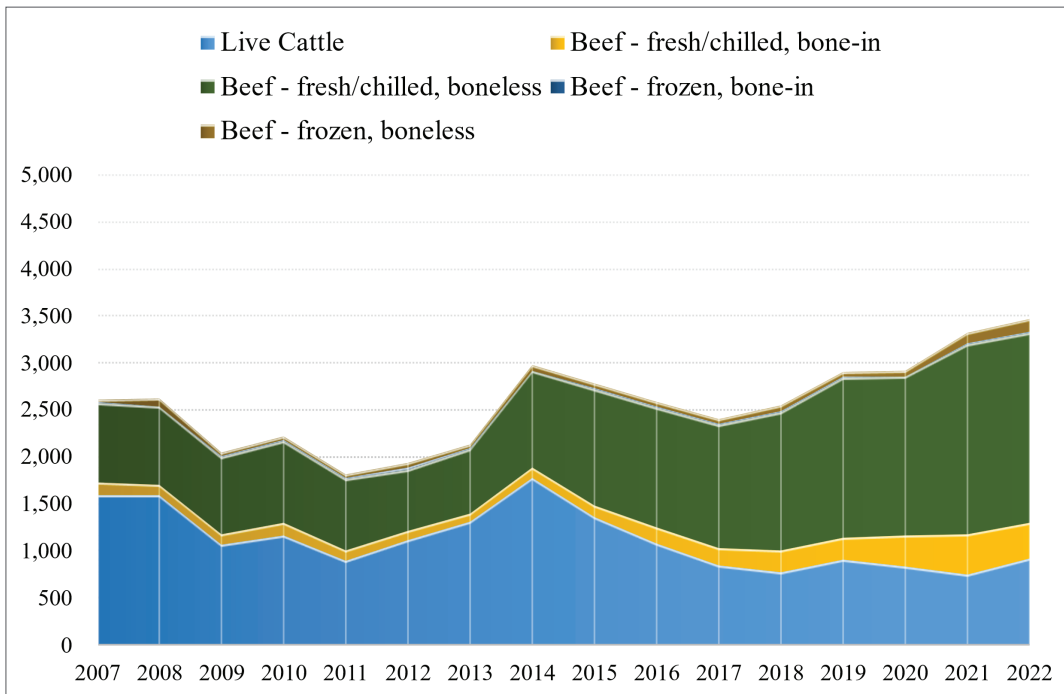
Canada's beef exports have been generally increasing. However, broad opportunities remain in international markets for Canadian beef. Also, there have been continuously rising challenges and increasing competition from other beef-exporting countries in several foreign markets. The Canadian cattle/beef sector would benefit from pursuing a broad strategy to increase its competitiveness in foreign markets by promoting its beef, raising production efficiency and reducing production costs, tackling labour shortages, alleviating regulatory constraints and integrating novel technologies in the production and processing of beef. These strategies align with the recommendations highlighted in Canada's National Beef Strategy 2020-2024 (Canadian Beef Strategy 2022). The sector should further enhance accessibility to new and emerging markets by establishing/upgrading business networks and reducing policy and non-policy trade costs. As the national strategy underlines (Canadian Beef Strategy 2022), it is essential to address misconceptions and misinformation surrounding animal welfare in beef production, the nutritional merits and health effects of beef consumption and the environmental impacts of cattle production.

It is also critical to encompass market strategies specific to destination countries, given the distinct trade conditions faced by Canada's cattle/beef exports to each market. Given the rising global political uncertainties and the varying regulations and policies vis-à-vis the importation of beef across destination countries, it is essential for the sector to sustain its market access to its largest trade partner, the U.S. Meanwhile, the sector should embark on enhancing access to other foreign markets and pursuing a pronounced diversification strategy to mitigate risks and uncertainties in international markets. Moreover, it is critical for the sector to increase its competitiveness vis-à-vis other beef-exporting countries, such as Australia, Brazil and the U.S. in various importing markets, such as China, Japan, South Korea, Saudi Arabia, Vietnam, Taiwan and the UAE. Trade preferences may not necessarily lead to significant increases in Canada's beef exports to foreign markets when preferential access is more pronounced for beef exported from other countries. Similarly, reductions in production and transaction costs should be relatively significant to effectively compete with other beef-exporting countries and to realize increases in Canada's beef exports to international markets.

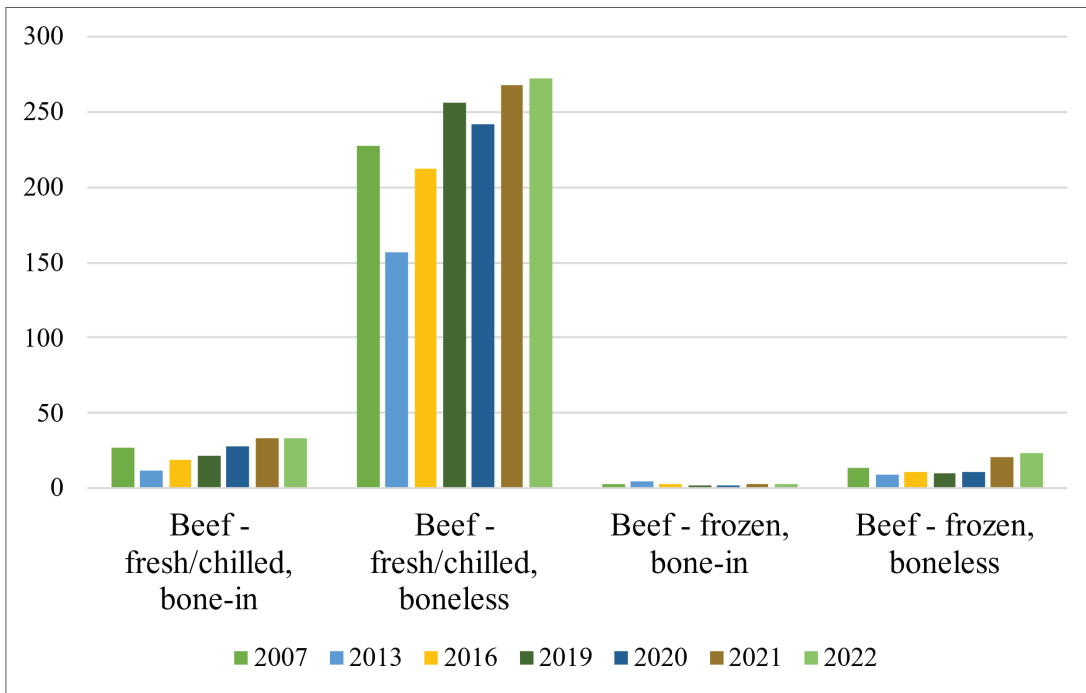
**Figure A.1. Canada's Live Cattle and Beef Exports to the U.S. — Values (Million Current C\$)**



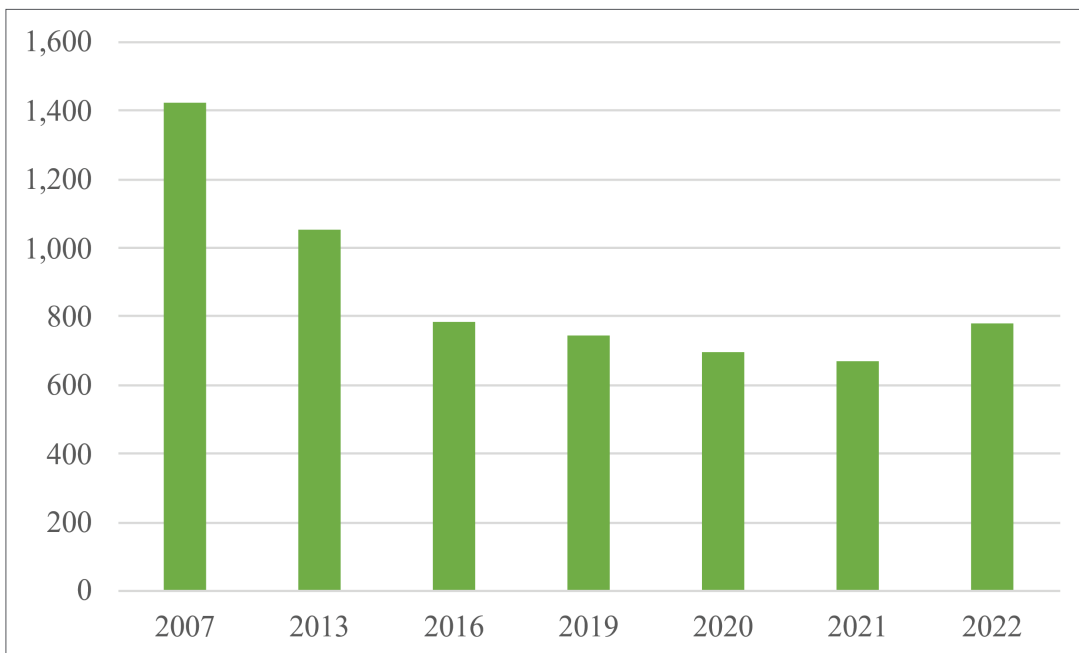
**Figure A.2. Canada's Live Cattle and Beef Exports to the U.S. — Values (Million Constant 2015 C\$)**



**Figure A.3. Canada's Beef Exports to the U.S. — Volumes (1,000 MT)**



**Figure A.4. Canada's Live Cattle Exports to the U.S. — Volumes (Head Units)**



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## ISSN

ISSN 2560-8312  
The School of Public Policy Publications (Print)  
ISSN 2560-8320  
The School of Public Policy Publications (Online)

## DATE OF ISSUE

August 2024

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